

JC14 Rec'd PCT/PTO 26 NOV 2001

13 Rec'd PCT/PTO 26 OCT 2001

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

01638/RPM

U.S. APPLICATION NO. (If known, see 37 CFR 1.5

09/980262

INTERNATIONAL APPLICATION NO.
PCT/EP00/03096 ✓INTERNATIONAL FILING DATE
7 April 2000 ✓PRIORITY DATE CLAIMED
7 May 1999 ✓TITLE OF INVENTION
COMMUNICATIONS SYSTEM HAVING ROAMING FACILITIES ✓

APPLICANT(S) FOR DO/EO/US

Deborah Nicole NAS & Mohammed Ismael KAZEM.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98. ; PTO/SB/08A; 5 references.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

Int. Search Report; Int'l. Preliminary
Exam. Report; Dutch priority document
w/translation; Request for Publ. of
Assignment Info; Change of Address Correspondence
form; 3 sheets formal drawings (Figs. 1-4).
Published Int'l. Appln. Pub. No. WO/00/69200;
Forms PCT/IPEA/402; PCT/RO/101; PCT/IPEA/401.

Express Mail Mailing Label
No.: EV 044 466 136 US
Date of Deposit: Oct. 26, 2001

I hereby certify that this paper is being
deposited with the United States Postal
Service "Express Mail Post Office to
Addressee" service under 37 CFR 1.10 on the
date indicated above and is addressed to
the Asst. Commissioner for Patents,
Washington, D.C. 20231

Barbara Villani
Barbara Villani

21. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**

Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
and International Search Report not prepared by the EPO or JPO..... \$1040.00

International preliminary examination fee (37 CFR 1.482) not paid to
USPTO but International Search Report prepared by the EPO or JPO \$890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO
but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO
and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

CALCULATIONS PTO USE ONLY

\$ 890.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$

CLAIMS

NUMBER FILED

NUMBER EXTRA

RATE

\$

Total claims

5 - 20 =

0

x \$18.00

\$

Independent claims

1 - 3 =

0

x \$84.00

\$

MULTIPLE DEPENDENT CLAIM(S) (if applicable)

+ \$280.00

\$

TOTAL OF ABOVE CALCULATIONS =

\$ 890.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above
are reduced by 1/2.

\$

SUBTOTAL =

\$ 890.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$

TOTAL NATIONAL FEE =

\$ 890.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$

TOTAL FEES ENCLOSED =

\$ 890.00

Amount to be
refunded:

\$

charged:

\$

a. ☒ A check in the amount of \$ 890.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 06-1378. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card
information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

FRISHAUF, HOLTZ, GOODMAN, LANGER & CHICK
767 Third Ave - 25th floor
New York, N.Y. 10017-2023

SIGNATURE

Robert P. Michal

NAME

Dated: October 26, 2001

35,614

REGISTRATION NUMBER

RPM:bv

13 Rec'd PCT/PTO 26 OCT 2001
09/980262

~~JCO3 Rec'd PCT/PTO~~ 26 NOV 2001

Attorney Docket No.01638/RPM

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No.: EV 044 466 136 US

**IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE**

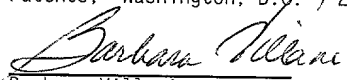
Date of Deposit: October 26, 2001

Applicant(s): D. NAS et al

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Serial No. : Based on
PCT/EP00/03096

Filed : Herewith


Barbara Villani

For : COMMUNICATIONS SYSTEM
HAVING ROAMING
FACILITIES

In the event that this Paper is late filed, and the necessary petition for extension of time is not filed concurrently herewith, please consider this as a Petition for the requisite extension of time, and to the extent not tendered by check attached hereto, authorization to charge the extension fee, or any other fee required in connection with this Paper, to Account No. 06-1378.

Art Unit :
Examiner :

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents
and Trademarks

S I R :


IN THE SPECIFICATION:

Page 1: Please insert the following as the first sentence:

--This application is a U.S. National Phase Application under 35 USC 371 of International Application PCT/EP00/03096 (published in English) filed April 7, 2000.--

A marked-up copy of page 1 is attached hereto.

Respectfully submitted,


Robert P. Michal,
Reg. No. 35,614

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Tel. No. (212) 319-4900
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RPM:bv

20000926 2320660

Communications system having roaming facilities.

09/980262

JCOB

26 NOV 2001

BACKGROUND OF THE INVENTION

5 The invention relates to a communications system, comprising several communications networks, and means for facilitating roaming for users on said several communications networks.

10 It is known that PLMN operators [PLMN = Public Land Mobile Network] mutually conclude roaming agreements. Such agreements, which regulate that subscribers of one PLMN may, and can, make use of another PLMN (this is called roaming) so far must always be gone into bilaterally between the several PLMN operators mutually. In addition, technical provisions which make all this possible, such as coupling network signalling, must be undertaken bilaterally. In this manner, roaming additionally is possible only between different PLMNs, but not between PLMNs and PSTNs (= Public Switched Telephone Networks).

SUMMARY OF THE INVENTION

20 It is the object of the invention to overcome said drawbacks. To this end, the invention provides for operators of telecommunications networks, i.e., PLMNs or PSTNs, to each conclude a bilateral roaming agreement with a global communications network - to which a satellite-communications network (= SCN) is particularly suited - and that in doing so the technical means are provided for realising said agreement. By way of only one agreement, namely, by the SCN, each PLMN or PSTN, as the case may be, receives roaming facilities with all other PLMNs and PSTNs which have also concluded such an agreement with the SCN. The telecommunications network concluding an agreement with the SCN should, for the purpose of realising said agreement, bring about a signalling coupling with the SCN. The SCN then provides signalling links with all telecommunications networks with which a roaming agreement has been concluded as well. There is therefore required only one signalling link with the SCN to obtain roaming with all networks connected to the SCN. The invention is based on the insight that an SCN, apart from as a platform for satellite communication, due to its far-reaching global setup and arrangement, is extremely suitable as a roaming platform ("facilitator") for different PLMNs and PSTNs.

40

--This application is a U.S. National Phase Application under 35 USC 371 of International Application PCT/EP00/03096 (published in English) filed April 7, 2000.--

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several communications networks, and means for facilitating roaming
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Network] mutually conclude roaming agreements. Such agreements,
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reaching global setup and arrangement, is extremely suitable as a
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IMPLEMENTATION

Below, the invention will be further explained by reference to several figures.

A calling user of a mobile terminal has a SIM card (SIM = Secure Identification Module) in which there is programmed an IMSI (= International Mobile Subscriber Identity). The IMSI consists of 15 positions, the first three of which standard denote the country of origin of the Network Operator (= NO) of the mobile user, the fourth and fifth denote the NO of the mobile user and the remaining ten positions may be freely completed by the NO. In the IMSI of users of an NO who - according to the invention - has concluded an agreement with the SCN, the first (three) digits of the field to be freely completed constitute a VNO code (VNO = Virtual Network Operator). Said VNO code is assigned, by a control module of the SCN, to each PLMN or PSTN with which the SCN, as may be seen from an entry into a VNO-code register (= VCR), has concluded a bilateral roaming agreement. It should be noted that a VNO is understood to mean an organisation managing a communications system having one or more network working elements (e.g., an HLR [= Home Location Register]) with which the VNO may add value to a base telecommunications service. In doing so, the VNO disposes, or not, of its own network (PLMN or PSTN).

PLMN subscribers roaming on a guest PLMN

When a (calling) user switches on his mobile terminal, a link is established between the mobile terminal and a VNO base station (in this case a PLMN) where the user wants to roam. In this case, the mobile terminal transmits the IMSI number of the SIM. The VNO network attempts to analyse at least the first 8 positions, in order to determine whether it concerns a home user (client of the own PLMN) or a roaming user (client of another PLMN). If analysis on the first 8 positions is impossible, or it concerns a roaming user, it is determined, on the basis of the first 5 positions, whether a roaming agreement has been concluded between the PLMN and the SCN. If, according to the contents of the VCR, a roaming agreement does indeed exist, a request for information on the user is placed, by way of signalling, with the SCN, which carries out an analysis on the VNO code to determine to which VNO the request must be passed on. The VNO will make available the requested information, by way of signalling, to the satellite network, which passes it on to the guest PLMN. If the calling user is accepted by the guest PLMN, said

information will be stored in the home PLMN in a Home Location Register (= HLR) and in the guest PLMN in a Visiting Location Register (= VLR). The costs of the communication by way of the PLMN are charged to the calling user by the home network.

Said procedures are in agreement with the current procedures laid down for roaming, and both said procedures and the means serving to carry them out are generally known.

Roaming on nonmobile networks

A nonmobile network (PSTN) may also facilitate roaming of mobile users or clients of another PSTN, provided that said PSTN is extended with the option of being capable of identifying and recording users; to this end, it should dispose of several network elements, such as HLR, VLR, Authentication Centre, Extended memory. Identification is effected by means of the IMSI on a SIM card and peripheral equipment made suitable for this purpose in the PSTN or a cordless-identification option.

PLMN- or PSTN-subscriber roaming on a PSTN

If a calling user ends up within the range of a transceiver station connected to a PSTN of a cordless system (e.g., a DECT [= Digital Enhanced Cordless Telecommunications]) and he disposes of a set wherein cordless communication is possible, he may make use of communication by way of the PSTN. Identification and communication between the PSTN and the SCN, and between the SCN and the home PLMN, is effected in accordance with the description above. The costs of the communication by way of the PSTN are charged to the calling user by the home network.

Due to the absence of a base station which determines the location of the roaming user (such as in the PLMN), the location of the roaming user on the PSTN is determined on the basis of the A-number (country code + network code + subscriber number) of the terminal to which the cordless transceiver station is connected. The user is accessible on the PSTN by way of his own (mobile) telephone number. *PSTN subscribers roaming on a PLMN or PSTN*

Wireline terminals may also make use of the aforementioned facilities. The terminal of a calling user does have to be provided with a SIM card identical to a SIM card for mobile terminals in PLMN networks. When the SIM card is inserted into a (public) terminal suitable for that purpose, identification and communication between the PSTN and the SCN, and between the SCN and the home PLMN or home

PSTN, take place in accordance with the procedure described above. Due to the absence of a base station which determines the location of the roaming user (such as in the PLMN), the location of the roaming user on the PSTN is determined on the basis of the A number (country code + network code + subscriber number) of the terminal to which the (public) terminal is connected. The user is accessible on the wireline set (PSTN) by way of his own (mobile) telephone number.

The costs of the communication by way of the PSTN are charged to the calling user by the home PSTN or home PLMN.

The enclosed figures provide an illustration of the invention. FIG. 1 shows the state of the art, in which several PLMNs conclude agreements with one another, and establish signalling channels and control modules for realising roaming facilities for the subscribers of said several PLMNs. FIG. 2 shows the architecture according to the invention, PLMNs and also PSTNs realising roaming facilities by way of a Satellite-Communications Network (= SCN) which is used here as a common roaming platform (facilitator). FIG. 3 shows a further elaboration of FIG. 2. An SCN connects several Land Earth Stations (= LESSs) to one another. These are the earth stations for satellite communication. The satellites with which said earth stations are communicating have not been drawn since said satellites per se have no function in the system according to the present invention. In conformity with the invention, the SCN - apart from the standard function of facilitating communication by way of satellites - accomplishes the function of facilitating roaming for subscribers who have entirely different operator networks, PSTNs and PLMNs, as their home network, in other words, to which they are subscribing. In conformity with the invention, operators of different PLMNs or PSTNs each conclude a bilateral roaming agreement with the SCN. The technical means for realising said agreements between the several PLMNs and PSTNs, respectively, and the SCN, comprise a register, the Virtual Network Operator Code Register VCR, which is located within the SCN, and may be approached under control of a control module CTR.

The VCR may consist of one register, which may be approached and interrogated by the several LESSs; if so desired, each LES may be provided with a copy VCR - to be continuously kept up to date - having (distributed) control means (CTRs). By way of one agreement with the SCN, technically to be realised by assigning, to the PLMN or PSTN, a VNO code (= VNC) and entering said VNC into the VCR, each PLMN or PSTN, respectively, entered into the VCR obtains roaming

facilities with all other PLMNs and PSTNs entered into the VCR. Upon entry into the VCR, there is also realised - under control of the control module CTR - a signalling coupling (interface) between the PLMN and PSTN entered, respectively, and the SCN. By way of the SCN, all entered PLMNs and PSTNs are then capable of exchanging signalling traffic - in this case, roaming information - with one another. This way, the SCN is used, apart from as a platform for satellite communication, by way of the VCR and the signalling couplings corresponding thereto, as an interworking platform for facilitating roaming between the several PLMNs and PSTNs.

As indicated above, the system proposed by the invention makes use of SIM cards having an IMSI adjusted for roaming. Such a SIM card is shown in FIG. 4. Standard are the country and operator codes, five characters in all. The ten remaining character positions not laid down in standards, are used in the system according to the invention for laying down, inter alia, the VNO code (three characters) of the home PLMN or PSTN, respectively.

CLAIMS

1. Communications system, comprising several communications networks, and roaming means for facilitating roaming to users on said several communications networks, CHARACTERISED IN THAT the roaming means are formed by a worldwide communications network (SCN), which is in connection with each of said several communications networks (PLMN, PSTN).

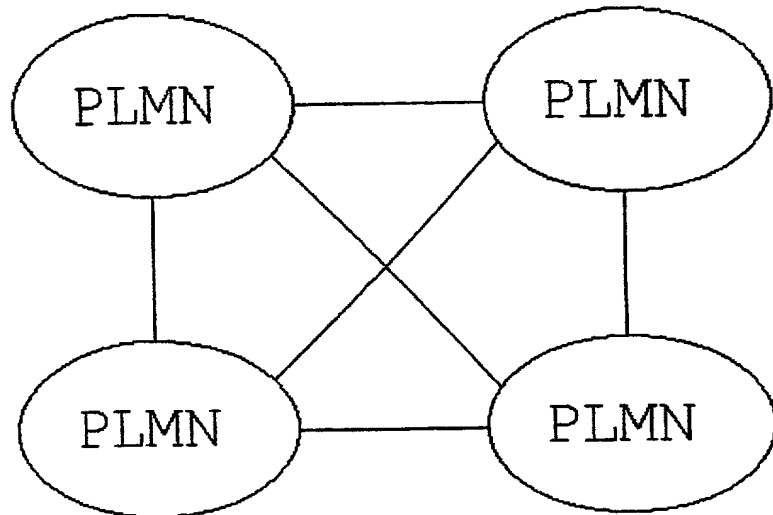
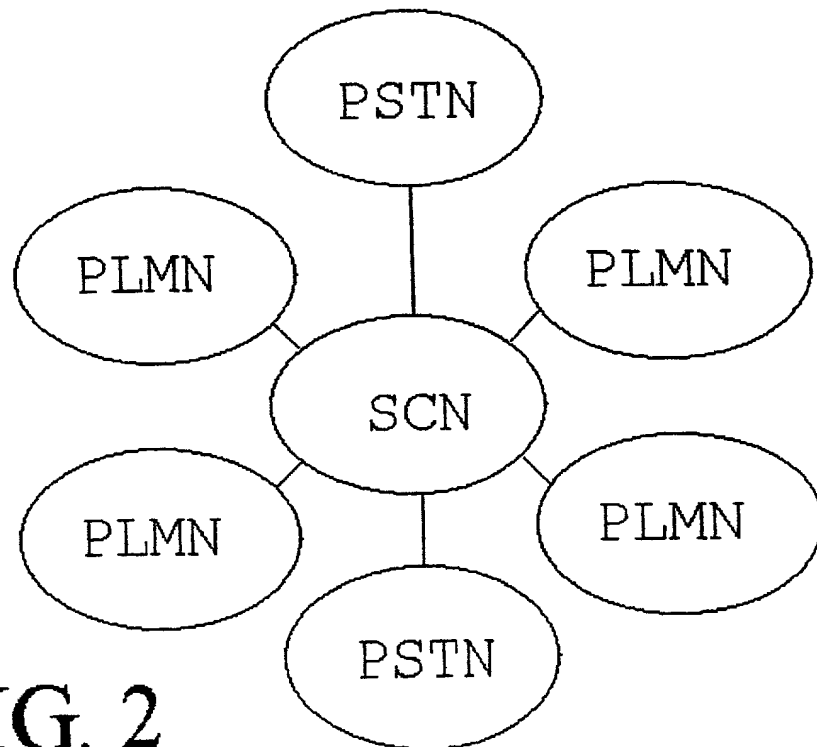
2. Communications system according to claim 1, CHARACTERISED IN THAT the roaming means are formed by the earth portion of a worldwide satellite-communications network (SCN), which is in connection with each of said several communications networks (PLMN, PSTN).

3. Communications system according to claim 1, CHARACTERISED IN THAT the worldwide communications network (SCN) assigns, to each of said several communications networks (PLMN, PSTN), a code (VNO) and enters it, under control of a control module (CTR), into a register (VCR), the worldwide communications network, under control of the control module, realising mutual roaming facilities to subscribers of each of said communications networks entered into the register.

4. Communications system according to claim 3, CHARACTERISED IN THAT terminals of the subscribers to the communications networks (PLMN, PSTN) comprise an identification module (SIM) for reading in and passing on, to the communications system, identification codes (IMSI), a code (VNO) among them which corresponds to the code entered into the register (VCR).

5. Communications system according to claim 3, CHARACTERISED IN THAT the worldwide communications network (SCN) determines the location of a roaming user on a wireline network (PSTN) on the basis of the A-number of the terminal to which the terminal on the network is connected.

1/3

**FIG. 1****FIG. 2**

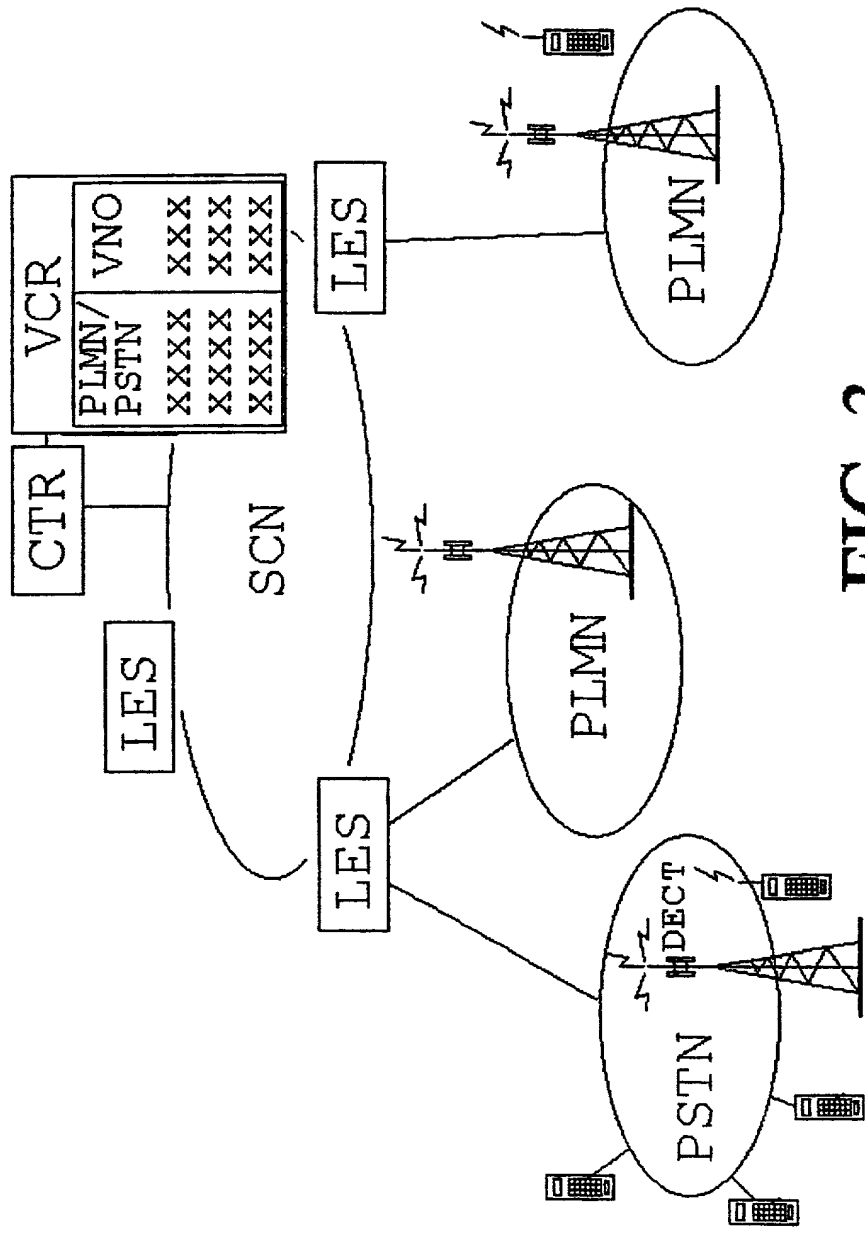


FIG. 3

3/3

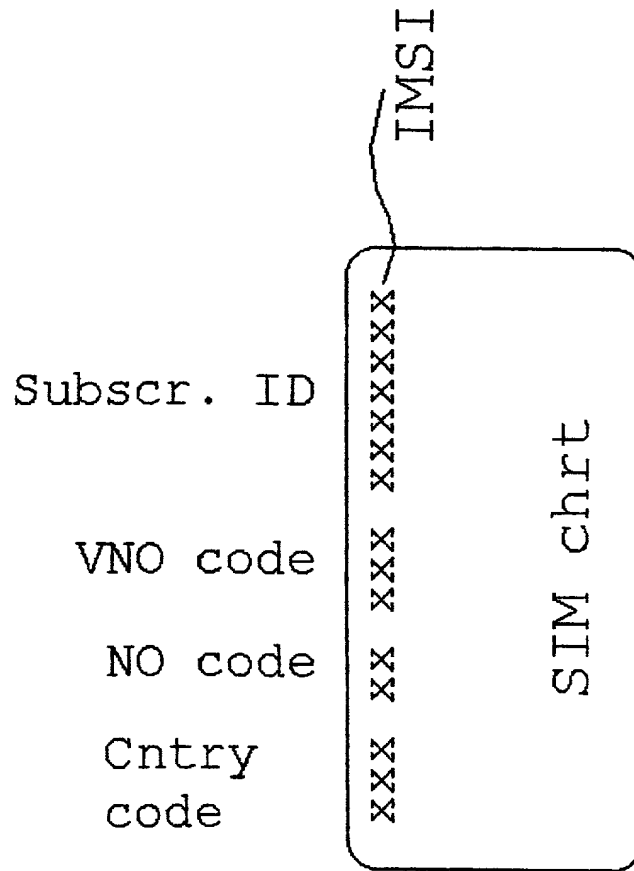


FIG. 4

APPLICATION FOR UNITED STATES LETTERS PATENT

Post-Filed PCT Declaration and Power of Attorney (35 U.S.C. 371(c)(4))

PCT Application - United States Designated Office

As a below named inventor, I declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

COMMUNICATIONS SYSTEMS HAVING ROAMING FACILITIES

described and claimed in Serial No. 09/980,262 deposited October 26, 2001 which is the national phase application of International Application Number PCT/EP00/03096 filed April 7, 2000; and amended on October 26, 2001

I have reviewed and understand the contents of said specification, including the claims.
I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.


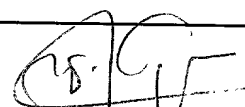
I claim priority benefits under 35 USC §119 of: (i) any foreign application(s) for patent or inventor's certificate listed below; or (ii) any United States provisional application(s) listed below; and have also identified below any foreign application(s) for patent or inventor's certificate, or PCT international application having a filing date before that of the application(s) on which priority is claimed.

COUNTRY	APPLICATION NUMBER	DATE (day, month, year)	PRIORITY CLAIMED
The Netherlands ✓	1011987 ✓	7 May 1999 ✓	yes <u>X</u> no _____
			yes _____ no _____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I appoint the following attorneys to prosecute this application and to transact all business in the U.S. Patent & Trademark Office connected therewith: Leonard Holtz, Reg. No. 22,974; Herbert Goodman, Reg. No. 17,081; Thomas Langer, Reg. No. 27,264; Marshall J. Chick, Reg. No. 26,853; Richard S. Barth, Reg. No. 28,180; Douglas Holtz, Reg. No. 33,902 and Robert P. Michal, Reg. No. 35,614.

CORRESPONDENCE AND CALLS TO: FRISHAUF, HOLTZ, GOODMAN, LANGER & CHICK, P.C.
667 Third Avenue - 25th Floor Tel.: (212) 319-4900
New York, New York 10017 Fax.: (212) 319-5101

INVENTOR: SIGNATURE		DATE	RESIDENCE AND POST OFFICE ADDRESS
Sign: 	Date: 6/2/2002	Residence (City & Country): The Hague, The Netherlands	
Type: Deborah Nicole NAS	Citizen of: THE NETHERLANDS ✓	Post Office Address: Gevers Deynootweg 960, 2586 BW THE HAGUE NLX The Netherlands	
Sign: 	Date: 6/2/2002	Residence (City and Country): The Hague, The Netherlands	
Type: Mohammed Ismael KAZEM	Citizen of: THE NETHERLANDS ✓	Post Office Address: Gevers Deynootweg 960, 2586 BW THE HAGUE NLX The Netherlands	

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26 NOV 2001

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PTO/SB/122 (10-00)

Approved for use through 10/31/2002. OMB 0651-0035

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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**CHANGE OF
CORRESPONDENCE ADDRESS
Application**Address to:
Assistant Commissioner for Patents
Washington, D.C. 20231

Application Number	09/980262
Filing Date	Herewith
First Named Inventor	NAS et al
Group Art Unit	
Examiner Name	
Attorney Docket Number	01638/RPM

Please change the Correspondence Address for the above-identified application to:



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I am the :



Applicant/Inventor.

Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

Attorney or Agent of record.



Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number _____

Typed or Printed
Name

Robert P. Michal, Reg. No. 35,614

Signature

Date

October 26, 2001

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.



*Total of _____ forms are submitted.

Burden Hour Statement. This form is estimated to take 3 minutes to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.